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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/660,807	09/11/2003	Atsuo Omaru	09792909-5671	7066

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EXAMINER	
WALKER, KEITH D	
ART UNIT	PAPER NUMBER
1745	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/660,807	OMARU, ATSUO	
	Examiner	Art Unit	
	Keith Walker	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-17 and 19-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-17 and 19-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/27/07 has been entered.

Response to Amendment

Claims 11-17 & 19-22 are pending examination and rejected as discussed below.

Claim Objections

Claim 15 is objected to because of the following informalities: The element "13i" in line 3 is unknown. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claim 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one

skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification does not appear to support the statement "...on top of each other up to a total of three or more layers."

2. Claim 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation "metal incapable of alloying with lithium" is not part of the original disclosure and is not supported by the specification. The specification describes a "metal not alloyed with lithium" (Instant Specification Pg. 9), which is not the same as a metal incapable of alloying with lithium.

3. Claim 21 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The formula $Li_xM_yO_z$ with the variables being $x>1$, $y>1$ and $z>2$ is not in the original specification. No support for this limitation is found and therefore this limitation is considered new matter. The original claims do not have the 'greater than' symbols and the original specification does teach or exemplify the claimed variable ranges.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 11-17, 21 & 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO/2001/084654 using US Publication 2003/0108795 (Tamura) as the English translation in view of US Patent 6,051,340 (Kawakami).

Tamura teaches a battery with a nonaqueous electrolyte containing an electrolyte salt solute, a cathode containing an active material and an anode ([0033-0042]). The anode includes a thin film layer of a metal that does not alloy with lithium, a thin film layer of metal that does alloy with lithium, a mixed layer composed of these metals between the thin film layers ([0007]); a thin film of hard carbon on the opposite surface of the metal that alloys with lithium than the metal that does not alloy with lithium ([0033]) and a thin film interlayer between the thin film of carbon and the metal that alloys with lithium ([0037-0040]). The use of metals that alloy with lithium for the negative electrode material is known ([0005]). The metal that alloys with lithium is a metal that forms a solid solution or intermetallic compound with lithium; examples include Sn, Ge, Al, In, Mg, Pb, Zn, Bi ([0017]). A current collector is part of the anode and cathode ([0103]). The metal that does not alloy with lithium ([0028]), the carbon

([0038]), and the interlayer ([0040]) are formed as thin films. The active materials for the positive electrode include lithium-containing transition metal oxides, such as $LiCoO_2$, $LiNiO_2$, and $LiMnO_2$. The anode further contains a layer of carbon material and polymer binder (polyvinylidene fluoride) ([0099]).

Tamura is silent to the use of a substrate comprising a polymer.

Kawakami teaches using an electrically conductive substrate between the current collector and the active material (Fig. 4e-4g; 10:40-11:15). The electrically conductive substrate comprises a polymer resin (14:5-15, 14:65-15:5). The polymer substrate follows the expansion and shrinkage to prevent anode deterioration (10:40-55).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the anode of Tamura with the polymer layer of Kawakami to increase the anode's current collecting performance by absorbing the expansion and contraction motion of the electrode.

Tamura is silent to the electrodes being coiled.

Tamura teaches the preparation of electrodes in which active material is deposited on a substrate, and then the substrate is cut into smaller pieces (Examples 1-7). One of ordinary skill in the art would have been familiar with wound cells at the time of invention and would have recognized that the coated electrode substrates and a separator could be formed into a wound assembly if the substrates were not cut after coating. Therefore, one of ordinary skill in the art at the time the invention was made to coil the coated substrates in the longitudinal direction with a separator in-between in order to produce a wound cell.

5. Claims 19 & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO/2001/084654 using US Publication 2003/0108795 (Tamura) as the English translation in view of US Patent 6,051,340 (Kawakami) as applied to claim 13 and further in view of WO 00/57507 (Hagg).

The teachings of Tamura and Kawakami as discussed above are incorporated herein.

Tamura and Kawakami do not disclose an anode substrate that is a high molecular weight polymer.

Hagg discloses typical polymeric electrode substrates; exemplary polymers are fluorocarbon polymers, polyamides, polyaramides, polyaryl sulfones, polyaryl sulfides, polycarbonates, polyesters, and polyolefins. Other exemplary polymers are found in *Polymer Handbook* (incorporated by reference into the WIPO reference) and include cellulose triacetate (Pg. VIII/3). These substrate materials possess the lowest electrical resistivities, require a relatively low bonding temperature and short processing time. (Pg. 11, ll. 35- Pg. 12, ll. 31; Pg. 22, ll. 34-36). The polymers of Hagg have specific gravities ranging from 0.9 to around 2.0 g/cc (www.polymerweb.com).

Therefore, one of ordinary skill in the art at the time the invention was made would have used such polymers as taught by Hagg as the electrode substrate as taught by Tamura in order to provide the lowest electrical resistivities and require a relatively low bonding temperature and short processing time.

Response to Arguments

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 6/27/07 have been fully considered but they are not persuasive. Applicant argues the combination of Kawakami with Tamura has no motivation and a simple citation to the presence of each element in the prior art does not suffice. As stated above, the motivation to combine the polymer of Kawakami with the anode of Tamura is to increase the anode's current collecting performance by absorbing the expansion and contraction motion of the electrode (Kawakami 10:40-55). Therefore motivation does exist and is provided by the teachings of the prior art and since applicant has admitted that all the elements are present in the teachings of the prior art, the claims are obvious over the prior art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keith Walker whose telephone number is 571-272-3458. The examiner can normally be reached on Mon. - Fri. 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

K. Walker

MARK RUTHKOSKY
PRIMARY EXAMINER

9.4.07